

Digital Human Research Center

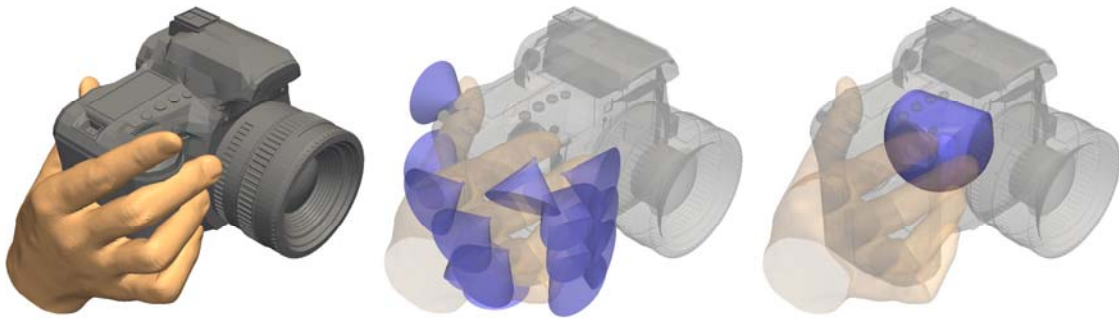
Health Technology Research Team

Health condition is the basis for quality of life. When the people are more healthy, more workers and more consumers are available for the society. Moreover, total medical expenses of the society will be reduced. Health technology research team focuses on locomotion for maintenance of health condition. Locomotion is one of typical daily activities, it can be acceptable for users for starting and continuing. We develop (1) an evaluation method of gait motion for dieting and/or reducing the risk of falls, (2) products and/or services for changing the gait motion, and (3) a validation method of the individual health condition. We investigate evaluation methods and information systems for health maintenance with industrial partners for ordinary people, elderlies and athletes.



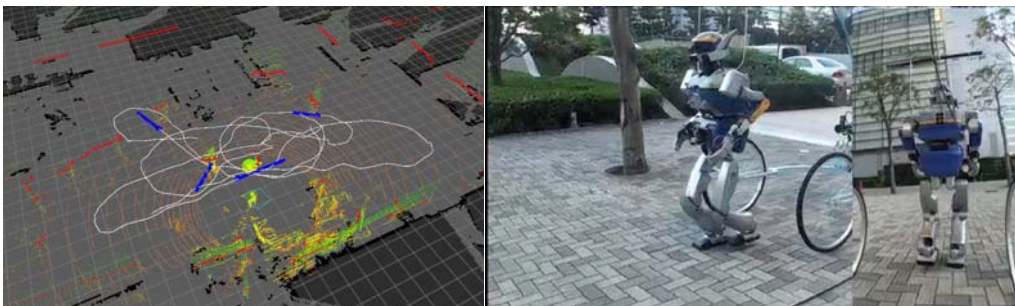
Human Centered Design Research

Human-centered design of industrial products is gaining popularity among manufacturers, since it enables high-value-added products, and consequently improves market competitiveness. There is especially strong demand for providing better user experience including usability and safety by considering the dynamic interactions between human body and industrial products. Our research team is working on these topics. We are developing subject-specific and statistical hand / whole body models including skin and bones, and applying these models to assess usability and safety of industrial products by computing dynamic interactions between them. This computer simulation is of importance in the product design since the designers have to optimize the design of the product so that it will be fit into our body with different dimensions and physical characteristics.



Smart Assist Technology Research

To provide assistance to people with the goal of increasing their quality of life, the level of help provided should vary according to each person's physical condition, life style, surrounding environment, and the task being undertaken. Simply performing all tasks while the person requiring assistance looks on, may not be the best approach. An artificial system providing such help should only provide assistance when the person finds it difficult or impossible to achieve by themselves. For this purpose, research into understanding human behavior and human environments becomes important. Our research center has developed techniques to measure human activity and constructed databases of measurement data for information such as a) human dimensions, b) human shape associated with body measurement points, c) human motion, and d) human behavior. Using these technologies, we are working on 1) the semantic understanding of human life and environment, 2) the ability to make plans to provide assistance by observing and understanding the target person, their environment and life style, etc, 3) control systems to provide physical assistance in real environments, and 4) how to interact and interface with people requiring assistance. Our current main goal is to develop a system that can provide mobility assistance and assistance in carrying an object. Through the development of such products and services, the aim of the research is to feed the results of collecting human activity data into the development cycle to improve the performance of the systems in providing assistance to people and to improve their quality of life.



Injury Prevention Engineering Research

In 2006, Digital Human Research Center proposed the model of the 'Safety Knowledge Circulating Society" and has been working to implement the model for injury prevention research and applications. The model conceptualizes an ideal cycle of safety knowledge from the injury occurrence to preventing similar injury occurrences. The cycle starts with injury surveillance to collect injury data which is practically useful in injury prevention, not just in counting injuries. Collected data will be used to construct mathematical models of injuries and human behaviors related to injuries. The models will help legislators, product designers, manufacturers, and others to design and develop safety products, accumulate and disseminate safety knowledge, and create social systems to advocate safety and injury prevention. Lastly, effective risk communication methodologies and technologies will be established to help the society better communicate about risks inherent in consumer products, and about safety knowledge.

